

326/693A-8/7/14

From "A Reactor Safety Program in the Health
and Safety Division, Chicago Operations Office"

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APPENDIX B

~ 7/31/57

CONTRACTOR

DESCRIPTION OF CONTRACT

Phillips Petroleum
Company

SPERT at NRTS - Scope and purpose is to subject heterogeneous reactor cores of differing designs to power excursions of increasing magnitude to determine the safe upper limit of available excess reactivity and the rates at which this excess may safely be added. Of particular interest also is the mechanism of the physical reactions which result in core damage, i.e., movements and possible occurrence of chemical reactions between fuel elements and coolants.

SPERT I is still in operation with core A. However, they are now working with a nine foot head of water in place of the original two foot head of water. Core B will be a core with physical design such that the plates of the fuel elements may be variably spaced.

SPERT II, originally designed to stand 300 psi and 400° F. has been bypassed. Construction will start about May, 1957.

SPERT III, designed to operate at 2500 psi, 668° F. The flow will be up to 20,000 gallons per minute so that the reactor can sustain 60 megawatts maximum for 30 minutes. This reactor is now under construction and is scheduled to go critical about July, 1957.

Atomics International

KEWB at Santa Susana, California - Kinetic Experiment on Water Boilers. This reactor series is intended to supply the same type of information for homogeneous reactors that the SPERT facility is providing for heterogeneous types. In addition to transient response, the effect of the shape of the core and of the container on the behavior and safety of homogeneous reactors will be studied.

methods of handling zirconium. High temperature reactions will also be studied.

The Ballistics Research
Laboratory, Aberdeen
Proving Ground

A theoretical study at Aberdeen, Maryland, of outer containment vessels (commonly known as vapor containers) to determine the applicable design criteria which will provide the desired degree of safety.

Naval Ordnance
Laboratory

This contract is being performed at White Oak, Maryland. The present program is concerned with the strength of scale models of reactor core pressure vessels. Variables such as the relative dimensions of the cylinder, the temperature of the system, and the rate of loading from the simulated excursion (using a blend of rocket propellant and high explosive) are studied.

Columbia University

Heat Transients in Fuel Elements. The purpose of this contract, in New York City, is to investigate the possibility of sudden burning out or melting of a fuel at such a rate that molten fuel is sprayed into the moderator water to form steam at an explosive rate. Chemical reactions are not considered.

Pennsylvania State
University

This study, being performed at University Park, Pa., is concerned with the development of nozzles for spraying water into reactor vessels for shut-down purposes. The problem is approached from a metallurgical viewpoint.

Arcos Corporation

This study is being performed in Chicago, Illinois. Its purpose is to develop welding techniques for large vapor containers and for pressure vessels.
